

# Authentication for Propulsion Test Streaming Video

Completed Technology Project (2012 - 2012)



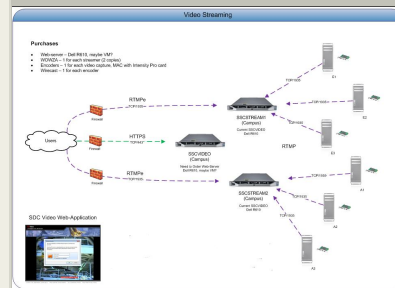
## Project Introduction

A streaming video system was developed and implemented at SSC to support various propulsion projects at SSC. These projects included J-2X and AJ-26 rocket engine testing. The previous methodology of allowing access to the project video streams was performed through the center firewall via the use of an IP address control list. This is not a true authentication method, but has been the only solution since the audience includes commercial partners external to NASA. An authentication for the propulsion test streaming video audience was required that could integrate with the Agency authentication methodology, especially for a specific internal audience (NASA and its contractors). An innovative approach had to be developed since team members consist of NASA and NASA contractor personnel as well as non-NASA personnel from commercial partners. The video stream for each project was designed to be limited to a specific audience, and would only be available to approved destinations within NASA, NASA contractors, and NASA partners/customer facilities. This project developed an authentication mechanism so that controlled access to each project video stream would be enabled, and only the identified members of the project team could view the video stream of the live engine test.

An application was developed that could enforce two-factor authentication for NASA access to the Propulsion Test Streaming Video System. To gain access to the Propulsion Test Streaming Video System, all user requests are submitted through the NASA Account Management System (NAMS). The assigned approver of these requests is the respective Project Manager for each of the engine test projects. Then, for authentication purposes, a user is required to use either a NASA issued SmartCard or RSA token to gain access to the website. Upon authentication, the user enters the website page. The page displays hyperlinks to each engine test video streams that the user has been granted access to. The user can then select the chosen video stream for live viewing from their end-user device/location. For commercial customers, the video stream is sent directly from the video encoder to the customer's corporate streaming server for distribution within the customer's facility. The architecture of the Propulsion Test Streaming Video System was redesigned in order to provide a service capable of supporting two-factor authentication.

## Anticipated Benefits

This Propulsion Test Streaming Video Authentication benefits directly supports the NASA and SSC mission to provide rocket propulsion testing services for agency and commercial partners. The OCIO had been requested by the SSC Center Director to provide the video streaming service in support of rocket propulsion testing. The service had been implemented and is operational. However, the authentication / access control that was previously being performed used an inadequate, conventional method that did not truly require



Video Streaming

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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Stennis Space Center (SSC)

### Responsible Program:

Center Innovation Fund: SSC CIF

## Authentication for Propulsion Test Streaming Video

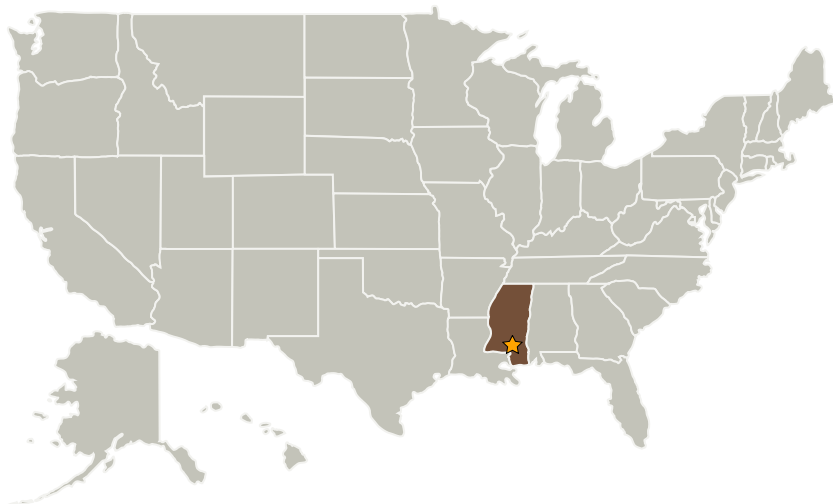
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“authentication”.

The Propulsion Test Streaming Video Authentication benefits NASA funded missions by allowing only the intended audience to view live feeds at their respective locations. This effort will have value as NASA increase joint activities with multiple commercial partners as emerging commercial space industry evolves, and the need to ensure privacy of proprietary data is required. This same concern may also be of value with international activities which may involve collaboration and again, the associated need for protection of proprietary information.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi

## Primary U.S. Work Locations

Mississippi

## Project Management

**Program Director:**

Michael R Lapointe

**Program Manager:**

Ramona E Travis

**Project Manager:**

David E Walters

**Principal Investigator:**

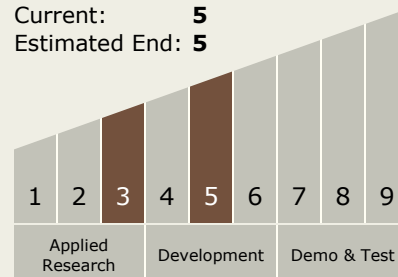
David E Walters

**Co-Investigator:**

Bonita J Oliver

## Technology Maturity (TRL)

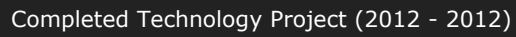
Start: 3  
Current: 5  
Estimated End: 5



## Technology Areas

**Primary:**

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.4 Information Processing
    - TX11.4.2 Intelligent Data Understanding



**Purchase**

- Web server - HTML, CSS, JS
- CDN - 1-3 second latency to the user
- Video server - 1-3 second latency to the user
- Network - 1-3 sec. round-trip

**Video Streaming Architecture**

The diagram illustrates the flow of video data from a **User** to a **Video Player**. The **User** interacts with a **Web Server** (HTML, CSS, JS) and a **CDN** (Content Delivery Network). The **CDN** serves the **HTML** and **JS** files to the **Video Player**. The **Video Player** requests the **Video Data** from the **Video Server** via **HTTP**. The **Video Server** then streams the **Video Data** to the **Video Player** via **RTMP** (Real-Time Messaging Protocol). The **Video Player** also receives **Video Data** from the **CDN** via **HTTP**. The **Video Player** is shown with a **Video Player** interface and a **Video Data** buffer.

**SDC Video Web Application**

The diagram shows a **Video Player** interface with a **Video Data** buffer and a **Video Player** control bar. The **Video Player** is shown with a **Video Data** buffer and a **Video Player** control bar.

## Video Streaming

TechPort